



A Biomass and Bioenergy Glossary for Forest Landowners

This publication defines unique biomass and bioenergy terms as they relate to forestry and forest management. These definitions will help you understand commonly used words and phrases that arise in biomass and bioenergy literature and discussions.

A

Acre — An area of land measuring 43,560 square feet.

Adaptive Management — A dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure that objectives are being met.

Anaerobic Digestion — Decomposition of biological wastes by micro-organisms, usually under wet conditions, in the absence of oxygen, to produce a gas comprising mostly methane and carbon dioxide.

Annual Removals — The net volume of growing stock trees removed from the inventory during a specified year by harvesting, cultural operations such as timber stand improvement, or land clearing.

Ash — The noncombustible components of fuel.

B

Barrel of Oil Equivalent (BOE) — The amount of energy contained in a barrel of crude oil, i.e. approximately 6.1 GJ (5.8 million Btu), equivalent to 1,700 kWh. A "petroleum barrel" is a liquid measure equal to 42 U.S. gallons (35 Imperial gallons or 159 liters); about 7.2 barrels are equivalent to one metric ton of oil.

Basal Area — (a) The cross-sectional area (in square feet) of a tree trunk at 4.5 feet above the ground (Basal area of a tree is $0.005454 \times \text{diameter (inches)}^2$). (b) The sum basal areas of the individual trees within 1 acre of forest. For example a well-stocked pine forest may have a basal area of 80 to 120 square feet per acre.

Best Management Practices — Management practices that maintain and improve the environmental values of forests associated with soils, water, and biological diversity; primarily used for the protection of water quality.

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Bio-based Products — A commercial or industrial product, other than food or feed, that is composed in whole or in significant part, of biological products or renewable domestic agricultural materials including plant, animal, marine materials, or forestry materials. (US Department of Agriculture designation)

Biochar — A type of charcoal produced from biomass via pyrolysis. Often used as a soil amendment.

Biochemical Conversion — The use of fermentation or anaerobic digestion to produce fuels and chemicals from organic sources.

Biodiesel — A form of fuel for use in diesel engines that is produced through a chemical process called transesterification whereby glycerin is separated from organically derived oils and fats.

Biodiversity — The variety of life forms in a given area. Diversity can be categorized in terms of the number of species, the variety in the area's plant and animal communities, the genetic variability of the animals, or a combination of these elements.

Bioenergy — Renewable energy produced from organic matter through the conversion of complex carbohydrates. This energy may either be used directly as fuel, processed into liquids or gasses, or be a residual of the processing or conversion mechanisms.

Biofuels — Liquid, solid, or gaseous fuels made from biomass resources, or their processing and conversion derivatives. Examples include biodiesel from vegetable oil, bioethanol from sugar cane or wood

chips, and biogas from anaerobic decomposition of wastes.

Biomass — Biomass is any organic matter including forest and mill residues, agricultural crops and wastes, wood and wood wastes, animal wastes, livestock operation residues, aquatic plants, and municipal and industrial wastes.

Biorefinery — A facility that processes and converts biomass into value-added products. These products include biomaterials, fuels (ethanol), or important feedstocks for the production of chemicals and other materials. Biorefineries can be based on a number of processing platforms using mechanical, thermal, chemical, and biochemical processes.

Black Liquor — Solution of lignin-residue and the pulping chemicals used to extract lignin during the manufacture of paper.

Bottom Ash — Ash that collects under the grates of a combustion furnace.

British Thermal Unit — A non-metric unit of heat, still widely used by engineers. One Btu is the heat energy needed to raise the temperature of one pound of water from 60°F to 61°F at one atmosphere pressure. 1 Btu = 1055 joules (1.055 kJ).

Bundlers — A machine that collects, compresses, and binds forest residues in to bundles.

C

Calorific Value — The maximum amount of energy that is available from burning a substance. See Higher Heating Value.

Cant — The remaining square section of a log when rounded edges and bark are removed.

Carbon Cycle — The distribution and transfer of carbon through the Earth's ecosystem that includes such processes as photosynthesis, decomposition, and respiration.

Carbon Dioxide (CO₂) — A colorless, odorless, incombustible gas formed during respiration, combustion of fossil fuels, and organic decomposition.

Carbon Displacement — Offsetting of carbon dioxide emissions from fossil fuel combustion by substituting fossil fuels with bioenergy.

Carbon Sequestration — The long-term storage of carbon in the terrestrial biosphere, underground, or oceans to reduce the buildup of atmospheric carbon dioxide concentrations.

Cellulose — A carbohydrate that is the principal component of the cell secondary walls of trees and other higher-order plants. It occurs with other components such as lignin's, hemicellulose, waxes, and gums to form long, hollow fibers.

Char — See Biochar.

Chip-n-saw — A cutting method used in cutting lumber from trees that measure between 6 and 14 inches diameter at breast height. The process chips off the rounded outer layer of a log before sawing the remaining cant or rectangular inside section into lumber. Chip-n-saw mills provide a market for trees larger than pulpwood and smaller than sawtimber.

Chipper — A large mechanized device that reduces logs, whole trees, slab wood, or lumber to chips of more or less uniform size. Stationary chippers are used in sawmills, while trailer-mounted whole-tree chippers are used in the woods.

Chips — Woody material cut into short, thin wafers. Chips are used as raw material for production of paper, fiberboard, biomass fuel, and other products.

Chip Van — Enclosed box trailers, generally 8 to 8.5 ft in width, designed to be less than 12.50 ft high when pulled by a road tractor. The difference between the box trailers seen on most highways and vans hauling harvesting products (bulk vans) is that most box trailers are built for containerized cargo (commodities in boxes or on pallets).

Clean Chips — Chipped wood free of bark, needles, leaves, and soil contamination.

Cleaning — Release treatment made in forest stand not past the sapling stage to free the favored trees from less desirable vegetation that currently or soon will overtop them.

Clearcutting — Regeneration or harvesting method that removes essentially all woody vegetation that would otherwise compete with future crop trees in a single harvesting operation.

Cofiring — Utilization of bioenergy feedstocks to supplement energy source in high efficiency boilers, usually with coal.

Cogeneration — The sequential production of electricity and useful heat energy from a common fuel source. Heat

from this industrial process can be used to power an electric generator, used for industrial processes, or space and water heating purposes.

Combustion — Burning. The transformation of biomass fuel into heat, chemicals, and gases through chemical combination of hydrogen and carbon in the fuel with oxygen in the air.

Combustion Efficiency — A measure of the productive capture of chemical energy in the fuel to heat energy, often expressed as a percentage or ratio.

Comminuted Material — Biomass material that has been pulverized or precision reduced into smaller sized material.

Container Trailer — A trailer designed to hold bulk material. Built to be sturdy and abused, they can be left on a site and filled as desired, and then removed and replaced with an empty container.

Cord — A stack of round or split wood consisting of 128 cubic feet of wood, bark, and airspace. A standard cord measures 4 feet by 4 feet by 8 feet. One cord weighs approximately 2.68 tons for pine and 2.90 tons for hardwoods.

Course Woody Debris — Any piece(s) of dead woody material (includes trunks, branches, and roots) on the ground in forest stands or streams with the large end diameter often greater than 5 inches.

Crop Tree — Any tree selected to grow to final harvest or to a selected size. Crop trees are selected for quality, species, size, timber potential, or wildlife value.

Crown Thinning — Removal of trees from the upper level in the canopy in order to favor desired crop trees whose crowns are at a lower position in the canopy.

Cull — A tree or log of marketable size that is rejected because it does not meet certain specifications of usability or grade because of species type or defects. Defects can include crookedness, decay, injuries, or damage from disease or insects.

Cut-to-Length — A harvest system in which trees are felled, delimbed, and cut to various log lengths at the stump.

D

Deadwood — Dead, standing or fallen, woody biomass from trees or shrubs. Deadwood can be the results of old age, fire, disease, logging, and natural disasters.

Deck — A pile of logs on a landing. See Landing.

Digester — An airtight vessel or enclosure in which bacteria decomposes biomass in water to produce gas. Also a chemical process for pulping operations.

Dirty Chips — Chipped wood containing bark, needles, leaves, and soil.

Down Woody Debris — Any piece(s) of dead woody material (includes trunks, branches, and roots) on the ground in forest stands or streams. The woody debris can be categorized as course woody debris or fine woody debris based on its large-end diameter.

E

Ecology — The science or study of the relationships between organisms and their environment.

Ecosystem Services — Benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling.

Effluent — The liquid or gas discharged from a process or chemical reactor, usually containing residues from that process.

Energy Crops — Crops grown specifically for their fuel value. Crops can include corn, sugarcane, switchgrass, and trees.

Energy Ratio — The ratio of the energy output versus the energy input. The energy ratio of a bioenergy process can be calculated and compared to a conventional fuel lifecycle. An energy ratio below one suggests energy input is greater than energy yield.

Environment — The interaction of climate, soil, topography, and other plants and animals in any given area. An organism's environment influences its form, behavior, and survival.

Even-aged Management — Management technique for a stand of trees composed of a single age class.

F

Feedstock — Raw material used for the generation of bioenergy and the creation of other bioproducts.

Feller-buncher — A self-propelled machine that cuts trees with saw or shears near ground level and then stacks the trees in piles to await transport (skidding).

Fermentation — Conversion of carbon-containing compounds by micro-organisms for production of fuels and chemicals such as alcohols, acids or energy-rich gases.

Fine Woody Debris — Any piece(s) of dead woody material (includes trunks, branches, and roots) on the ground in forest stands or streams with the large end less than 5 inches in diameter.

Flail Delimber — A machine used for delimbing tree stems. Flails are mounted on spinning drums that mechanically beat the limbs from the tree stem.

Fly Ash — Ash transported through the combustion chamber by the exhaust gases and generally deposited in the boiler heat exchanger.

FOB — An acronym for free on board, indicating that the price quoted includes loading on or in the specified container.

Foliage — trees and other plant leaves, considered as a group.

Forest Health — A measure of the vigor of forest ecosystems. Forest health includes biological diversity; soil, air, and water productivity; natural disturbances; and the capacity of the forest to provide a sustained flow of goods and services for people.

Forest Type — Groups of tree species commonly growing in association because of similar environmental requirements. Examples include pine and mixed hardwood; cypress, tupelo, and black gum; and oak and hickory.

Forest Residue — Tops, limbs, bark, foliage, and other woody materials, left after a harvest.

Forwarder — A vehicle that carries logs completely off the ground from stump to road side landing.

Fossil Fuel — Solid, liquid, or gaseous fuels formed over million of years from plant and animal residues under high temperature and pressure. Oil, natural gas, and coal are fossil fuels.

Fuel Cell — A device that converts the energy of a fuel directly to electricity and heat, without combustion.

Fuel Treatment Thinnings — The process of harvesting trees and underbrush from the forest to reduce the risk of wildfires.

Full Cost Method — Cost accounting method that allocates the total production cost across biomass and conventional wood products.

Furnace — An enclosed chamber or container used to burn biomass in a controlled manner to produce heat for space or process heating.

G

Gas Turbine — A turbine that converts the energy of hot compressed gases, produced by burning fuel in compressed air into

mechanical power. Often fired by natural gas or fuel oil.

Gasification — A chemical or heat process to convert a solid fuel to a gaseous form.

Gasifier — A device for converting solid fuel into gaseous fuel.

Gigawatt — A measure of electrical power equal to one billion watts or 1,000,000 kilowatts. A large coal or nuclear power station typically has a capacity of about 1 GW.

Glucose — A six-carbon fermentable sugar ($C_6H_{12}O_6$)

Grade — Utilization and established quality or use classification of lumber, trees, or other forest products.

Green Ton — 2000 lbs of undried biomass. Moisture content must be specified if green tons are used as a measure of fuel energy.

Greenhouse Gas — A gas that absorbs radiant energy from the earth, re-emitting it as infrared radiation, contributing to the warming of the earth. Examples of greenhouse gases include carbon dioxide and water vapor.

Grid — An electric utility company's system for distributing power.

Grinder — A machine that reduce particles in size by repeatedly pounding them into smaller pieces through a combination of tensile, shear and compressive forces.

Group Selection — Is an uneven-aged regeneration method used for sun loving tree species in which trees are removed and

new age classes are established in groups. The width of a group is approximately twice the height of mature trees.

H

Habitat — The place or environment where a plant or animal naturally or normally lives, grows and reproduces.

Heat Rate — The amount of fuel energy required by a power plant to produce one kilowatt-hour of electrical output. A measure of generating station thermal efficiency, generally expressed in Btu per net kWh. It is computed by dividing the total Btu content of fuel burned for electric generation by the resulting net kWh generation.

Hemicellulose — A polysaccharide (complex carbohydrate) found in plant cells that is easily extracted by dilute alkalies.

High Grading — A harvesting technique that removes only the biggest and most valuable trees from a stand and provides high returns at the expense of future growth potential. Poor quality, shade-loving trees tend to regenerate and dominate high-graded sites.

Higher Heating Value — The maximum potential energy in bone-dry fuel. For wood, the range is from 7,600 to 9,600 Btu/lb.

Hog Fuel — Wood and wood waste biomass processed by grinding for use in a combustor.

Hydrocarbon Feedstock — Petroleum (hydrocarbon) based substance used as a raw material in an industrial process.

Examples of petrochemical feedstocks are ethylene, propylene, butadiene, benzene, toluene, xylene, and naphthalene.

Hydrolysis — A chemical reaction that releases sugars from cellulose and hemicellulose, which are normally linked together in complex chains.

I

Improvement Cutting — An intermediate, partial, harvest that removes less desirable trees of any species to improve the form, quality, health or wildlife potential of the remaining trees. Usually occurs after the sapling stage and before final harvest.

Incinerator — Any device used to burn solid or liquid residues or wastes as a method of disposal. In some incinerators heat is recovered.

Inclined Grate — A type of furnace in which fuel is gravity fed from the top part of a grate in a continuous ribbon, passes over the upper drying section where moisture is removed, and descends into the lower burning section. Ash is removed at the lower part of the grate.

Independent Power Producer — A power production facility that is not part of a regulated utility.

Indirect Impacts — The inter-industry effects of input-output analysis; the impacts above and beyond the direct effects when applied to Type I multipliers.

Indirect Liquefaction — Conversion of biomass to a liquid fuel through a synthesis gas intermediate step.

Induced Impacts — The impacts of household expenditures in input-output analysis.

J

Joule — Metric unit of energy, equivalent to the work done by a force of one Newton applied over a distance of one meter. One joule = 0.239 calories.

K

KG and Pile — A site preparation method in which stumps are pushed up, sheared off, or split apart by a specially designed blade mounted on a bulldozer. Debris is then piled or placed in long rows (windrows) so that an area can be bedded or flat planted.

KG Blade — A bulldozer-mounted blade used in forestry and land-clearing operations. A single spike splits and shears stumps at their base.

Kilowatt — A measure of electrical power equal to 1,000 watts. 1 kW = 3412 Btu/hr.

Kilowatt Hour — A measure of energy equivalent to the expenditure of one kilowatt for one hour. For example, 1 kWh will light a 100-watt light bulb for 10 hours.

L

Landing — A cleared working area in the forest where trees and logs are transported (skidded) to be sorted, processed, and loaded on a truck. See Deck.

Liberation Cutting — Removal of poor quality or un-merchantable trees to favor the growth of desirable trees.

Lignin — Structural constituent of wood and (to a lesser extent) other plant tissues, which encrusts the cell walls and cements the cells together.

Logging residues — The unused portions of growing-stock and non-growing-stock trees cut or killed by logging and left in the woods.

Log Rule or Log Scale — A table that estimates volume or product yield from logs and trees, based on a diagram or mathematical formula.

Log Trailer — A trailer designed to haul trees, poles, or shortwood in racks. They are lightweight and have high payload capacities.

Low Thinning — Removal of smaller, weaker, and most deformed trees whose crowns are in the lower portion of the stand canopy.

Lump Sum Sale — A timber sale in which the buyer and seller agree on a total price for the standing timber. The standing timber is either marked or is in a delineated area.

M

Marginal Cost Method — Cost accounting method that counts only the additional costs from the conventional logging operation as the biomass production cost.

Marginal Land — Land that does not consistently produce a profitable crop because of infertility, drought, or other physical limitations such as shallow soils.

MBF — Abbreviation denoting 1,000 board feet. MBF is a typical unit of trade for dimension lumber and sawtimber stumpage.

Megawatt — (MW) A measure of electric power equal to one million watts (1,000 kW)

Merchantable Height — The stem length, measured from one foot above the ground to a 10-, 6-, or 4-inch diameter top, above which no other saleable product can be cut. Diameter, local markets, limbs, knots, and other defects collectively influence merchantable height.

Mill/kWh — Tenths of a U.S. cent per kilowatt hour. A common method of pricing electricity in the United States.

Mill Residues — Excess material generated from wood processing mills and pulp and paper mills.

Mixed Stand — A timber stand containing two or more prominent species in the main canopy.

MMBtu — One million British thermal units.

Moisture Content — The weight of the water contained in wood, usually expressed as a percentage of weight, either oven-dry or as received (green).

Monoculture — The cultivation of a single species crop.

N

Natural Stand — A stand of trees grown from natural seed fall or sprouting.

Negotiated Sale — A timber sale in which the buyer and seller negotiate a price for the standing timber. The standing timber is either marked or is in a delineated area.

Net Annual Growth — The average annual net increase in the volume of trees during the period between inventories.

Nitrous Oxides (NO_x) — A product of photochemical reactions of nitric oxide in ambient air, and the major component of photochemical smog.

Nonindustrial Private Forest (NIPF) — Forest land that is privately owned by individuals or corporations other than forest industry.

O

On the Stump — Standing, uncut timber.

One-pass Method — A harvest practice where biomass and conventional roundwood (sawlogs) are harvested and recovered simultaneously.

Output — The value of production by industry for a specific time period.

Oven Dry Ton — An amount of wood that weighs 2,000 pounds at zero percent moisture content.

Overstory — The portion of the trees forming the uppermost canopy in a forest stand.

Ozone — A compound that is formed when oxygen and other compounds react in sunlight. In the lower atmosphere (ground-level) it is photochemical smog and is considered a pollutant.

P

Per-unit Sale — A timber sale in which the buyer and seller negotiate a price per unit of harvested wood, and the buyer pays for the timber after it is cut and the volume is determined.

Petrochemical Feedstock — Petroleum (hydrocarbon) based substance used as a raw material in an industrial process. Examples of petrochemical feedstocks are ethylene, propylene, butadiene, benzene, toluene, xylene, and naphthalene.

Photosynthesis — A complex process that occurs in the chlorophyll cells of plants to build carbohydrates from carbon dioxide and water, using energy derived from light.

Plantation — Planted pines or hardwoods, typically in an ordered configuration such as equally spaced rows.

Poles or Poletimber — Trees from 5 to 7 inches in diameter at breast height.

Pre-commercial Thinning — Thinning that occurs when trees are too young, too small, or of species undesirable to be used for traditional timber products.

Process Heat — Heat used in an industrial process rather than for space heating or other power generation purposes.

Producer Gas — Fuel gas high in carbon monoxide and hydrogen, produced by gasifying a solid fuel with insufficient air or by passing a mixture of air and steam through a burning bed of solid fuel.

Pyrolysis — The thermal decomposition of biomass at high temperatures (greater than 400° F, or 200° C) in the absence of air. The

end product is a mixture of solids (char), liquids (oxygenated oils), and gases (methane, carbon monoxide, and carbon dioxide) with proportions determined by operating temperature, pressure, and other conditions.

Pulpwood — Wood used in the manufacture of paper, fiberboard, or other wood fiber products. Pulpwood- sized trees are usually a minimum of 4 inches in diameter.

Q

Quad — One quadrillion Btu (10^{15} Btu) = 1.055 exajoules (EJ), or approximately 172 million barrels of oil equivalent.

R

Reforestation — Reestablishing a forest by planting or seeding an area from which forest vegetation has been removed.

Regeneration Cut — A cutting strategy in which old trees are removed while favorable environmental conditions are created for the establishment of a new stand of seedlings.

Reproduction — (a) The process by which young trees grow to become the older trees of the future forest. (b) The process of forest replacement or renewal through natural sprouting or seeding or by the planting of seedlings or direct seeding.

Residual Stand — Trees left in a stand to grow until the next harvest. This term can refer to crop trees or cull trees.

Residues, Biomass — Byproducts that

have significant energy potential from processing all forms of biomass.

Rotation — The number of years required to establish and grow trees to a specified size, product, or condition of maturity.

S

Salvage Cutting — Removal of trees that have dead, damaged, or are expected to die, generally as a result of natural disaster, pest infestation, or disease infestation.

Sanitation Cut — Removal of dead and weaker trees in an overstocked stand to reduce the danger of natural disasters.

Seed-tree Harvest — A silvicultural system in which all trees are harvested except for a small number of selected trees are retained for seed production for natural regeneration.

Shelterwood Harvest — A silvicultural system in which trees are removed in a series of two or more cuts, leaving those needed to produce sufficient shade to produce a new forest in a moderated microenvironment. This method produces an even-aged forest.

Short-rotation Woody Crops — Fast growing species, such as willows and poplars, which are grown specifically for the production of energy.

Shredder — A machine that tears material apart by shearing.

Silviculture — Science and art of managing the establishment, growth, composition, and quality of forest stands and woodlands for the desired needs and

values of landowners and society on a sustainable basis.

Site Index — See Site Productivity.

Site Productivity — Combination of soil and climatic factors contributing to plant growth and development; may be measured as biomass accumulation per unit of time.

Skidder — Machinery used to pull logs from their stump to a landing. Logs are pulled with a grapple, cable-winch, or clam-bunk.

Slash — (a) Tree tops, branches, bark, or other residue left on the ground after logging or other forestry operations. (b) Tree debris left after a natural catastrophe.

Softwood (conifer) — A tree belonging to the order Coniferales. Softwood trees are usually evergreen, bear cones, and have needles or scale-like leaves.

Soil Fertility — The total availability, concentration, and amount of essential plant nutrients.

Soil Function — The role that soils play in the environment and managed landscapes.

Soil Productivity — The capacity of a soil to contribute to the production of a crop, whether it is agricultural crops or forest biomass.

Stand — A group of trees of similar age-class, composition, and structure growing on a site of uniform quality.

Stand Density — The number or mass of trees occupying a site. Usually measured in basal area or square feet per acre.

Stocking — A description of the number of trees, basal area, or volume per acre in a forest stand compared with a desired level for balanced health and growth. Most often used in comparative expressions, such as well-stocked, poorly stocked, or overstocked.

Streamside Management Zones — Buffer zones in which cover is retained in riparian areas adjacent to surface water and aquatic habitat.

Stumpage — The value or volume of a tree or group of trees as they stand uncut in the woods (on the stump).

Sustainability — The capacity of forests to maintain their health, productivity, diversity, and overall integrity, in the long run, in the context of human activity and use. Sustainability can apply to single forest or ecoregions.

Sustainable Forest Management — Forest management that ensures that forest resources will be managed to supply goods and services to meet the current demands of society while conserving and renewing the availability and quality of the resource for future generations.

Sustained Yield — A forest management strategy in which the net growth and yield are balanced.

Syngas — A gas mixture that contains varying amounts of carbon monoxide and hydrogen generated by the gasification of a carbon-based fuel to a gaseous product with a heating value.

T

Thinning — A tree removal practice that reduces tree density and competition among remaining trees in a stand.

Timber Stand Improvement (TSI) — Improving the quality of a forest stand by removing or deadening undesirable species to achieve desired stocking and species composition. TSI practices include applying herbicides, burning, girdling, or cutting.

Tolerant Species — A species of tree that has the ability to grow in the shade of other trees and in competition with them.

Transpiration Drying — The natural drying that occurs when leafy biomass material is left on the tree.

Tree-length — Trees felled, delimbed, and topped in the stump area and processed at the landing.

Two-pass Method — A harvest practice where roundwood and biomass are recovered in separate passes. Biomass removal can precede or follow the conventional product harvest.

U

Understory — (a) The layer formed by the crowns of smaller trees in a forest. (b) The trees beneath the forest canopy

Uneven-aged Management — A regeneration and management technique that removes some trees in all size classes either singly, in small groups, or strips in order to maintain a multi-aged stand.

Urban Residues — Wood and yard waste;

construction and demolition debris from an urban source.

V

Value-added — Payments made by industry to workers, interest, profits, and indirect business taxes.

W

Water Quality — Suitability of the water coming from ground and surface water supplies for drinking water, recreational uses, and as habitat for aquatic organisms and other wildlife.

Water Quantity — Timing and total yield of water from a watershed.

Watt — The common base unit of power in the metric system. One watt = 3.413 Btu/hr.

Whole Tree Chips — Wood chips produced by chipping whole trees, usually in the forest. Thus the chips contain both bark and wood.

Whole Tree Harvesting — Trees are felled and transported to roadside with branches and top intact. Processing occurs at the deck or landing.

Wood Ash — Ash recovered from the combustion of woody biomass; may be used as fertilizer or soil liming agent to reduce soil acidity.

Wood Processing Residue — The unused portion of materials generated during wood processing or by-products created during the pulping process.

Woody Biomass — The trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment that are the byproducts of proper forest management.

Y

Yarding — The initial movement of logs from the point of felling to a central loading area or landing, particularly by cable or helicopter.

Yeast — Any of various single cell fungi capable of fermenting carbohydrates

Definitions for this publication were compiled from

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